

REMARKS

Please reconsider the present application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering the present application.

I. Disposition of Claims

Claims 1, 3-6, 10, 12-15, and 17 are currently pending in the present application. By way of this reply, claims 1, 10, and 17 have been amended.

II. Claim Amendments

Claim 1 has been amended to recite that the if-converting comprises (i) testing a condition code associated with conditional instruction and (ii) writing Boolean data to a general register designated as a destination register based on the testing, the destination register representing a predicate. No new matter has been added by way of these amendments as support for these amendments may be found, for example, on page 12, line 19 – page 14, line 17 of the present application.

Claim 10 has been amended to recite that the means for if-converting comprises (i) means for testing a condition code associated with conditional instruction and (ii) means for writing Boolean data to a general register designated as a destination register based on the testing, the destination register representing a predicate. No new matter has been added by way of these amendments as support for these amendments may be found, for example, on page 12, line 19 – page 14, line 17 of the present application.

Claim 17 has been amended to recite that the if-converting comprises (i) testing a

condition code associated with conditional instruction and (ii) writing Boolean data to a general register designated as a destination register based on the testing, the destination register representing a predicate. No new matter has been added by way of these amendments as support for these amendments may be found, for example, on page 12, line 19 – page 14, line 17 of the present application.

III. Rejection(s) Under 35 U.S.C § 103

Claims 1, 3, 4, 6, 10, 12, 13, and 15 of the present application were rejected under 35 U.S.C. § 103(a) as being unpatentable over “Intel® IA-64 Architecture Software Developer’s Manual” (hereinafter “IA-64”) in view of the reference entitled “A Framework for Balancing Control Flow and Predication” (hereinafter “Hwu”) and U.S. Patent No. 6,637,026 (hereinafter “Chen”). For the reasons set forth below, this rejection is respectfully traversed.

The present invention is directed to a technique for optimizing predicated code. The technique involves an if-converting step that tests a conditional instruction to determine how the conditional instruction will execute. *See* Specification, page 12, lines 19 – 20. Depending on that determination, a Boolean value is written to a general register specified as the destination register. *See* Specification, page 12, lines 20 – 23. The destination register subsequently acts a predicate. *See* Specification, page 12, lines 26 – 27. Thus, condition code registers are effectively replaced with general registers, thereby eliminating the use of condition codes that otherwise degrade instruction-level parallelism. *See* Specification, page 12, line 27 – page 12, line 2. The Boolean data in the general registers allow Boolean operations to be performed in combination with other

predicates using ordinary logical operations. *See* Specification, page 13, lines 2 – 4. Therefore, the need for special operations otherwise needed for condition code-based predicates is reduced/avoided. *See* Specification, page 13, line 5.

Accordingly, amended independent claims 1 and 17 of the present application require, in part, that the if-converting comprise (i) testing a condition code associated with conditional instruction and (ii) writing Boolean data to a general register designated as a destination register based on the testing, the destination register representing a predicate. Independent claim 10 has been amended with similar language, albeit of different claim scope in means-plus function format.

IA-64, on the other hand, fails to disclose at least the limitations of the claimed invention discussed above. Although IA-64 generally describes if-conversion (*see* IA-64, § 10.2.3), IA-64 is completely silent as to condition codes. Thus, IA-64 necessarily cannot and does not disclose testing a condition code and/or writing a value to a general register based on that testing as required by amended independent claims 1, 10, and 17 of the present application.

Hwu, like IA-64 discussed above, fails to disclose all the limitations of the claimed invention or supply that which IA-64 lacks. Hwu, which discloses a compilation technique that allows a compiler to maximize the benefits of predication as a compiler representation while delaying the final balancing of control flow and predication to schedule time (*see* IA-64, Abstract), is completely silent as to condition codes. Thus, Hwu necessarily cannot and does not disclose testing a condition code and/or writing a value to a general register based on that testing as required by amended independent claims 1, 10, and 17 of the present application. Accordingly, Hwu fails at least to

disclose those limitations of the claimed invention not disclosed in IA-64.

Chen, like IA-64 and Hwu discussed above, fails to disclose all the limitations of the claimed invention or supply that which IA-64 and Hwu lack. Chen, which discloses a technique for inserting an alerting instruction to alert a global register allocator to map particular virtual predicates to the same physical registers (*see* Chen, Abstract), is completely silent as to testing a condition code, and, based on the testing, writing a Boolean value to a general register designated as a destination register as required by amended independent claims 1, 10, and 17 of the present application. Accordingly, Chen fails at least to disclose those limitations of the claimed invention not disclosed in IA-64 and Hwu.

In view of the above, IA-64, Hwu and Chen, whether considered separately or in any combination, fail to show or suggest the present invention as recited in independent claims 1, 10, and 17 of the present application. Thus, independent claims 1, 10, and 17 of the present application are patentable over IA-64, Hwu, and Chen. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

IV. Conclusion

The above amendments and remarks are believed to require no further prior art search. Also, Applicant believes that this reply is responsive to all outstanding issues and places the present application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Because the amendments and remarks simplify the issues for allowance or appeal, and do not constitute new matter, entry and consideration thereof is respectfully requested.

Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226.037001; P5009).

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Respectfully submitted,



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